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De- and Re-Institutionalizing Technology Assessment in Contemporary Knowledge-Based Economies

A Side-by-Side Review of Flemish and Walloon Technology Assessment

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This article illuminates the potential role of technology assessment (TA) in knowledge-driven science, technology and innovation (STI) regimes by providing a comparative review of Flemish and Walloon TA. It draws critical attention to the ways in which TA actors and institutes in Flanders and Wallonia position themselves, or are positioned, in relation to dominant innovation policies and large-scale political transformations, notably the convergence of STI around the knowledge-based economy (KBE) and the regionalization of STI policy in Belgium. The article's findings shed light on the Flemish government's recent decision to close its parliamentary TA institute and the institutional expansion of TA in Wallonia and elsewhere in Europe. It argues that TA has politics, as TA in Flanders and Wallonia aligns with the advent of strategic science and is also affiliated to specific political parties. As these considerations run counter to the dominant representation of TA as a neutral governance tool that serves the needs of all STI decision makers, they draw into question the viability and utility of TA within contemporary KBEs.

1 Introduction

Today, industrialized nations and regions invest increasing amounts of public resources in science and technology. Flanders and Wallonia are no exception to this general trend. Originally unified with the regions of Brussels under a common Belgian government and administration, Flanders and Wallonia have developed their own science, technology, and innovation policies. While these policies serve Flemish and Walloon policymakers

and innovation actors (e.g. politicians, captains of industry, enterprises) as a lever for regional economic development and regional self-assertion (Delvenne 2011; Delvenne et al. 2013), they also increasingly converge around the global knowledge-based economy narrative. Accordingly, both regions presently structure their STI policies around the KBE principles of knowledge accumulation and market-driven innovation. In Flanders, this represents an effort to become a "leading innovation region" (VIA 2006) that can compete with the best innovation economies in the world, while in Wallonia a vision is projected of the region becoming "the architect of its own fate" (GW 2005, p. 3). As stated in the Walloon government's 2005 Marshall Plan,[1] "economic recovery should bear on innovation and industry-university partnership within a European Knowledge Society/ Economy" (GW 2005, p. 22).

Taking these local and global market-driven imperatives as its entry points, this article renders explicit how STI in Flanders and Wallonia is affected and, potentially, transformed by *technology assessment.* Broadly defined, TA encompasses activities and programs that extend and deepen the knowledge base of contemporary KBEs, often beyond purely economic and commercial interests (van Oudheusden et al. 2014). As we illustrate in this article, initial Flemish TA initiatives in the 1980s challenged technology-centric, market-led innovation policies for failing to consider the wider social, ecological, and ethical ramifications of technology. By deepening and broadening traditional, usually linear, views of innovation, Flemish TA has evolved with Flanders' transition to a knowledge-driven economy that seeks to be competitive *as well as* sustainable, inclusive, and democratic (VIA 2006).

Conversely, in Wallonia, due to the institutional fragmentation of STI competence across overlapping communal and regional substate entities, the absence of TA is linked to the belated emergence of a socioeconomic context that is conducive to knowledge-driven innovation.[2] Over the last fifteen years, however, STI policies have dramatically evolved and even become a cornerstone of Walloon regional policymaking. As we will see, these shifts were accompanied by a rise of interest in TA on behalf of Walloon governing bodies and policymakers.

To put these considerations in due empirical and comparative perspective, we retrace the emergence and evolution of Flemish and Walloon TA in connection with regional innovation policy. We draw on accounts provided to us by policy analysts and spokesmen, industry research leaders, trade unionists, civil servants, parliamentarians and academics very knowledgeable of regional, Belgian, and European innovation policy and TA, as well as information taken from the secondary literature on innovation policy and TA. We stress that this study does not fully map the policy debate on STI in Flanders and Wallonia. Rather, the emphasis is on TA actors and processes, and particularly on TA's institutional uptake and the potential impact on STI policymaking.

Our review brings a macrosociological and political sensitivity to bear on TA and STI processes. We suggest that TA processes both enact as well as counteract dominant STI policies and justifications, and typically do so at the intersection of sociotechnical spheres, policies, and temporalities. How TA communities position themselves or are positioned by innovation actors (e.g. politicians, industrialists, the media) in relation to dominant policy paradigms (e.g. responsible research and innovation and the KBE) is particularly relevant for consideration in view of the Flemish government's 2012 decision to close its parliamentary TA agency, the Institute for Society and Technology. It is also important in view of recent attempts to set up a Walloon parliamentary TA institute. Whereas the Flemish decision appears largely out of sync with the growth and development of TA activity across Europe,[3] it coincides with the recent transformation of the iconic Danish Board of Technology into a nonprofit trading foundation.

2 Technology Assessment in Belgium

Since the 1970s, constitutional reforms have gradually transformed Belgium from a unified state into a federal one with communities, regions, and language areas. The reforms were enacted as a means of finding constitutional and legal solutions for the problems between the country's Dutch and

French speaking communities. As a consequence of these reforms, the STI regime (Delvenne 2011; Fallon 2011) in Belgium came to be decentralized, based on a horizontal division of policy domains between the regions of Flanders (in the north), Wallonia (in the south), and the Brussels capital region (in the center). Each entity now pursues, develops, and implements its own STI policies, more or less independent from the federal state and from one another. For instance, in 2003, Flanders launched its *Innovation Pact*. In 2005, Wallonia launched its *Marshall Plan* (since 2009 known as *Marshall Plan 2. Vert)*, while Brussels initiated a *Regional Innovation Plan*.

The Roots of Flemish TA

Although Flanders is presently the economically richer region, it lagged behind Wallonia until the middle of the twentieth century. The region gradually became more prosperous than Wallonia after the Second World War, following the decline of Wallonia's "old" coal and iron industries (Halleux et al. 2009). When the first ever Flemish government came to power in the 1980s, it made attempts to boost Flemish economic self-awareness and position Flanders as an industrial, entrepreneurial and highly technological region (Oosterlynck 2006, p. 98). A determining figure in this transformation was the then chair of the Flemish government, Gaston Geens. Geens launched "DIRV", which stands for Derde Industriële Revolutie Vlaanderen, literally Third Industrial Revolution Flanders.

The program lent support to various "basic" and "applied" technologies, including the highly promising and already emanating fields of biotechnology, new materials, and microelectronics. Less perceptibly, but equally important, DIRV delivered a decisive break with economic pessimism in Flanders. It was a conspicuous campaign, which served the Flemish government as a means to present "a clear image of itself to the general public, with an offensive policy of its own, distinct from both Walloon policy and national policy" (Goorden 2004, p. 8).

Various authors and interviewees hence identify DIRV as a "keystone" not just in instigating contemporary innovation policy in Flanders, but also acknowledge its role in contributing to a range of political-economic reforms that primarily emphasized entrepreneurship and restricted Keynesian state intervention in the economy. While these restructurings emerged in response to various international and domestic trends and challenges (e.g. the linguistic conflict in Belgium), they were also the result of ideological crafting and the search for new policy paradigms (Witte et al. 1997, p. 321). It is, partly at least, against this background that ensuing programs, actions, and controversies in the Flemish innovation context should be understood, including the emergence and development of TA.

As a program of large-scale reform, DIRV met with strong opposition from the political left, including the socialist trade union ABVV (representing traditional industries, among others). One of its most vocal critics in the Flemish parliament is the socialist Norbert De Batselier. These actors criticized DIRV for its strong emphasis on entrepreneurship and small government, and its neglect of social dimensions.

In response to these criticisms, Geens conceded to the demands of the trade unions to erect the Stichting Technologie Vlaanderen (STV), which officially translates into Flemish Foundation for Technology Assessment. As a government-financed agency led by the social partners[4] and embedded in the Social Economic Council of Flanders (SERV), STV's aim was to analyze the social dimensions of new technologies and advise the government on issues of science and technology (SERV 1994; SERV 1998; Goorden 1990). Shortly after STV's creation, the first TA initiatives were launched as academic research programs. Following Goorden (2004, p. 11), we label these initiatives *early-warning TA,* as they were charged with examining the social impact of new technologies such as biotechnology and microelectronics.

Two TA Initiatives in Wallonia

The emergence of Flemish TA did not go unnoticed in the south of Belgium. In the aftermath of DIRV, the then Walloon minister of Research and Technology, Melchior Wathelet (Christian Social Party, PSC), attempted to position Wallonia in re-

lation to Flemish innovation policy. While some Walloon labor representatives and social partners in the Walloon Economic and Social Council (CESRW) favored the erection of an institute like STV in their region, liberal and Christian-Democratic parties feared such an institute would reinforce the power of the social partners. Even so, in 1988 Melchior Wathelet proposed a study on the opportunity and feasibility of erecting a Walloon PTA institute. This study was delegated to the Research Center in Informatics and Law (CRID) at the University of Namur. The CRID team visited several TA institutions across the globe and recommended a TA model quite similar to that of the US Office of Technology Assessment, OTA. When it came to assessing this study, the CESRW pointed out that this proposition did not fit the Walloon context and the needs of potential users. In addition, it criticized the limited institutional approach and its disconnection to European evolution, especially the "participatory turn" in Denmark (Joss 1998) and the rise of constructive TA in the Netherlands (Schot/Rip 1997).

The second initiative to introduce TA came from Gérard Valenduc, then representative of the Christian trade union at the CESRW, and member of its research commission, the Walloon Council for Science Policy (CPS). In 1991, he obtained funding for a new exploratory project called Experiences of Mediation and Evaluation of Research and Technological Innovation (EMERIT) from the new minister in charge of New Technologies, Albert Liénard (also a Christian-Democrat). The idea behind EMERIT was to catch up with recent regional TA developments in other European regions (e.g., in Baden-Wurttemberg) and to develop TA activities based on concerted social measures. These objectives differed markedly from the original idea of supporting parliamentary decision making, centering instead on fostering the appropriate conditions for an innovation-friendly socioeconomic climate. Then, in 1994, following a conference within the EMERIT framework, Liénard announced his proposition to assign the CPS (nested within the CESRW) a TA mission. The CESRW accepted but some of its members remained suspicious about TA, an activity it had not been prepared for. After completing four studies, the CPS in 2002 decided to abort its TA mission, considering that it had not succeeded in attracting the attention of its main addressees, the Walloon parliament and government. In fact, the CPS never received any demands for formal TA from its addressees. Its most successful activities were those dedicated to the popularization of science, which were not tailored to meet their users' political needs and failed to move the social debate forward (Delvenne 2009).

Bottom-up and Interactive TA in Flanders

Meanwhile, in Flanders another STI policy vision came to the fore. Flemish policymakers, innovators, and entrepreneurs asserted that Flemish innovation policy needed a more integrated take on innovation that acknowledges the complex interplay between science, technology, and other, nontechnical groups of actors, such as social and economic sectors. Policymakers therefore called for a kind of bottom-up TA, which they described as an approach "that may not slow down or have a negative influence on creativity and the innovation process".[5] To this end TA activities had to be organized in close interaction with R&D efforts in governmental technology programs on biotechnology, new materials and energy, and environmental technology. The expectation was that if TA were conducted in direct consultation with science and technology producers, research would lead to socially useful applications.

Their successive bottom-up experience with relegating TA to R&D projects and technological programs led scientists and technologists to think critically about their research activities. However, because the institutional context for R&D did not systematically offer any incentives to civil society, as well, to reflect on technological developments, the palette of contributed perspectives shrank to those areas that are considered most relevant to scientists and engineers, notably safety and health risks, and market opportunities.

In order to create a more interactive type of TA in which Flemish civil society, as well as citizens, participate through a deliberative process, in 2000 TA was assigned to an institution advising the Flemish parliament, the Flemish Institute for Science and Technology Assessment (viWTA, later renamed the Institute Society and

Technology, IST, before the institute's closure in 2012; Delvenne et al. 2012). The institute adopted a twofold mission: to stimulate social debate on sociotechnical developments, and to inform and advise MPs on the social, ethical, and economic implications of scientific-technological developments. To these ends, viWTA initiated participatory activities within and outside the Flemish parliament (e.g., citizen workshops, public debates, and technology festivals).

It is important to note that with the erection of viWTA, TA was removed from the R&D enterprise itself. That is, in contrast to several STV programs and early-warning TA initiatives mentioned above, TA was not fully ingrained in the innovation process. Rather, TA took place in a different location and time, namely in a parliamentary setting.

The Rebirth of Parliamentary TA?

Ironically, a few years before the IST's closure, TA again gained momentum in Wallonia.[6] A political scientist at the University of Liège (and co-author of this article), Pierre Delvenne, initiated contact with Walloon policymakers with the aim of raising awareness about TA (Delvenne 2009; Delvenne et al. 2012). After having initiated a series of interactive workshops involving government officials, consultative groups, labor unions, and others, about the prospects of TA in Wallonia, a Walloon MP by the name of Joëlle Kapompolé (Socialist Party) publicly announced a proposal for a parliamentary decree to found a TA institute linked to parliament. Other MPs, as well as the former minister for New Technologies and Research declared they would support the proposal. Subsequently, in November 2008, it was stated that a special line of funding would be considered. According to the proposal, the TA institute "should make use of participatory methods and function as an exchange and discussion platform for constructive social debate on technological options without being an obstacle to technological development". However, several issues remained to be clarified. During the 2009 regional elections, the Socialist and Ecologist parties included the concept of a TA institute in their programs.[7] After the elections, when a political majority comprising Socialists, Ecologists, and Christian-Democrats was installed, the establishment of a TA institution became part of the government's agenda.

In May 2011, the ministers Jean-Claude Marcourt (Socialist, in charge of new technologies) and Jean-Marc Nollet (Ecologist, in charge of research and science policy) referred to Kapompolé's initiative to announce a joint initiative for a full-fledged Walloon Institute of Technology Assessment. They emphasized its role for policymaking as well as its potential contribution to stimulating societal debate on science and technology. They also underlined that the new institute should function as a completely independent office within parliament and would rely on a network of experts. Government and parliament were identified as the main users of the TA structure, and to a certain extent it was even suggested that organized citizen groups would be able to ask the TA office to commission TA studies. Furthermore, the joint initiative emphasized the importance for the future structure to mobilize participatory methods, a procedure that is relatively uncommon in Wallonia.

However, political tensions between the two ministers in charge led to a blockade of the project for almost two years. These tensions were related to divergent political visions regarding the future of Wallonia rather than to opposing perspectives on TA. The main issue concerned the addressees of the TA institute: As a convinced regionalist, Marcourt wanted the TA institute to work exclusively for the Walloon region (and thus for the Walloon region's parliament and government). Nollet, on the other hand, demanded that the institute address the parliament and government of the French Community as well. Whereas the regionalist argument underlined the territorial differences between Brussels and Wallonia, the integrationist vision highlighted regional incorporation. Accordingly, Nollet planned to establish a new science policy across the whole of Wallonia-Brussels and had similar plans for TA. It took both ministers' cabinets about two years to reconcile their seemingly incompatible views.

Despite this blockade, throughout 2013 several MPs from the major political fractions consulted the SPIRAL Research Centre at the University of Liège to help initiate the establishment

of a parliamentary working group on TA in the Walloon parliament. The SPIRAL unit (supported by the PACITA project) responded by setting up a series of "Technology Assessment working lunches"[8] aimed at raising awareness of TA among MPs and their collaborators (van Oudheusden 2013). These sessions were dedicated to a TA simulation exercise on a topic of interest to MPs (e.g., aging populations, cloud computing, sustainable consumption) in order to jointly explore how TA can inform and support parliamentary work on STI. As the TA working lunches were generally well received, the parliament's president Patrick Dupriez (Ecologist) joined Joëlle Kapompolé and her colleagues from the parliamentary working group to write another decree proposal to establish a TA institution serving parliament and government, again with the support of the University of Liège. At the end of the legislature, a full-grown decree was approved in the plenary session and put on the agenda of the committees in charge of research, economy, and new technologies. However, at the end of the legislature in spring 2014, parliament was dissolved before the concerned committees could pass the decree. As a consequence, the decree presently remains in limbo in the legislative process.

3 Discussion

The historical overview above allows us to pinpoint and compare defining characteristics of Flemish and Walloon TA, partly in light of recent TA developments across Europe.[9]

To begin with, it is striking that both Flemish and Walloon TA emerged and matured in a strategic, knowledge-centered STI environment, i.e., an environment that forges new alliances between the scientific establishment, policymakers, and societal actors for the sake of science-driven economic development. In fact, Walloon TA did not mature *until* such a strategic science regime was firmly in place, bringing to the fore systemic approaches to innovation and university-industry partnerships (Fallon/Delvenne 2009). Thus, the institutionalization of TA may well *depend* upon the emergence of strategic science as a new mode of knowledge production (Delvenne 2011). Following Rip (2000), strategic science heralds a shift in scientific knowledge production from relatively isolated, "basic", academic research, to research that is economically and socially relevant and that can only be understood within a context of its use. TA potentially transforms this context by bringing more diverse epistemic cultures and "knowledges" into STI processes. Knowledge here no longer only refers to intellectual property, technological applications, and scientific theories, but also, and increasingly, to new kinds of expertise (e.g., sociological, lay, indigenous), to new forms and manifestations of relevance (e.g., social and ecological concerns), and the democratization of sociotechnical culture at large (Knorr-Cetina 1999, p. 8; Bijker 1995). TA can thus contribute to broadening, deepening, and governing knowledge in contemporary KBEs, which is precisely what STI policymakers and various innovation enactors claim innovation is, or *should be*, about.[10]

The emergence of the EU-wide Science in Society projects like Parliaments and Civil Society in Technology Assessment (PACITA 2011–2015) lends weight to the above hypothesis.[11] While it is too early to determine the policy impact of PACITA, it is important to note that PACITA is designed to facilitate "coordination and networking activities, dissemination and use of knowledge" in support of research activities and policies. In fact, PACITA is construed as a "Mobilisation and Mutual Learning Action Plan [that] will distribute capacity and enhance the institutional foundation for knowledge-based policy-making on issues involving science, technology and innovation (…)".[12] The potential influence of PACITA is felt in Wallonia, which in contrast to Flanders has never institutionalized TA, but which now explicitly gears its STI policy towards the KBE and strategic science (Plan Marshall 2. Vert; Plan Marshall 2022).

It would thus appear that TA not only relies on, but *thrives in,* the context of knowledge-driven innovation. However, if TA is to exert a *lasting* influence in the KBE, TA actors must clearly present TA's credentials as a decisive knowledge player to policymakers and innovation actors. We return to this point shortly.

Second, Flemish and Walloon TA tap into a political culture that emphasizes the importance of concerted social action. In Belgium, collective

bargaining between trade unions, employers' organizations, and governments is an important political and social tradition that allows TA practices to gain a firm foothold in multilayered, consociational democracies (Lijphart 1977). The erection of the Flemish TA institute STV in response to the DIRV campaign and the lodging of a Walloon TA mission in the Economic and Social Council (CESRW) in the 1990s illustrate this point, as trade unions demanded their say in STI policymaking.[13] Seen in this way, TA can arbitrate between scientific, political, and social worlds. When TA is integrated into R&D settings (e.g., Flemish technology action programs) and/or embedded into parliaments or other formal policymaking bodies, it can open new negotiation practices and establish a more integrative and inclusive decision-making culture.

However, the institutionalization of TA also entails risks. As noted earlier, when the IST (formerly viWTA) was installed in the Flemish parliament in 2000, TA was physically removed from the R&D process. Thus, while TA gained a foothold within formal Flemish policy circles, it became less ingrained in scientific and technological research activities across the region. In addition, as Horst (2014) argues in relation to the restructuring of the DBT by the Danish government in 2011, when TA is embedded within formal policy-making bodies and processes, it risks being domesticated or "tamed". This is because established organizations may find it hard to change, adapt, and reposition themselves to meet new needs in complex and changing environments (Gubrium/Holstein 2001). As Horst notes, in Denmark democratic debate about science and technology lost momentum *after* the DBT's institutionalization in 1986. In the years that followed, Danes came to take debate of this kind for granted. In fact, many Danes appeared ignorant of the DBT's existence in spite of its high international visibility.

Whether or not similar assertions can be made about the closing of the Flemish IST is an open question, which we do not delve into in this article. Rather, we want to draw attention to the political affiliations of Flemish and Walloon TA. As illustrated by the erection of STV in 1984, Flemish TA emanated on the left side of the political spectrum, specifically among the green and socialist parties. The same political families initiated parliamentary TA, which led to the erection of viWTA (IST) in 2000. Arguably, in Wallonia the politics of TA are not so outspoken or visible. Yet, it should be noted that the Socialist and Ecologist factions took the initiative to institutionalize TA and that TA is typically associated with a political preference for more participatory or deliberative modes of decision making. These preferences are not neutral. They have been reproduced in a great number of other European countries where left-wing political parties play, or played, a key role in institutionalizing TA (Delvenne 2011). As noted elsewhere (van Oudheusden 2014), TA's political affiliations are often denied or downplayed across TA communities. TA is typically framed as an analytic activity aimed at providing decision makers with an objective analysis of a technology (van Eijndhoven 1997) and/or as an interactive and communicative tool that aims to enrich the basis for public debate and STI decision making (Decker/Ladikas 2004). These broad designations (i.e., geared towards all political factions and to the benefit of all innovation actors) risk trivializing and undermining the very policy changes TA advocates seek to instigate when TA is associated with *specific* political parties or politicians.

The above considerations deserve to be taken into account, as they shed light on how and why TA is institutionalized (or conversely, de-institutionalized), and how TA is enveloped in broader STI processes, such as the EU-wide shift towards responsible innovation (von Schomberg 2011). They are also helpful when reflecting on the evolving viability and utility of TA within contemporary KBEs, as TA and STI processes have coevolved as "dancing partners," relatively independent from one another and yet in continuous interaction (Rip 1992). The Flemish and Walloon TA experiences described in this article can thus serve TA communities, STI policymakers, and innovation scholars as entry points to ponder the role, place, and orientation of regional, national, and European TA in the years ahead.

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Notes

1) Marshall Plan is the name given to a broad socioeconomic policy program that intends to revitalize the Walloon economy along the lines of innovation, entrepreneurship, and creativity.
2) In a case study approach to "expanding the TA landscape in Wallonia", Delvenne et al. (2013, pp. 283–284) provide a more detailed account of the institutional fragmentation of STI competence in Belgium. They point to differences between Flanders and Wallonia that hindered the emergence of KBE rationales in Wallonia.
3) Notably through the EU-wide Framework 7 project Parliaments and Civil Society in Technology Assessment (PACITA), on which more follows below.
4) The term "social partners" is often used in Belgian policy discourse and encompasses employers' organizations and trade unions. These actors are regularly engaged in formalized and structured socio-professional negotiations following the political model of consociationalism (Lijphart 1977).
5) Technology Note of the Flemish government (1994).
6) It is worth noting that the closure of IST hardly drew policy attention in Wallonia, whereas TA, as a topic of interest, did. This says much about the effects of regionalization of Flemish and Walloon STI policy and the public scope of debates on science in society in Belgium.
7) In Wallonia and Brussels, the green, or environmentalist, political party is called Ecolo, which is short for the French word écologiste.
8) Prior to these TA working lunches, an international conference was held in the Walloon parliament (March 8, 2013), which gathered former and actual directors or senior staffers from TA institutions in the United States and Europe. See van Oudheusden (2013) and the event's website, http://tapw.wordpress.com/, last accessed on September 3, 2014.
9) These reflections build on and are further developed in van Oudheusden et al. 2014.
10) Consider the many EU policy discourses on integrating science in society for the sake of good innovation governance. For instance, in a 2013 Expert Group Report to the EU's Directorate General for Research and Innovation, we read that "The [Responsible Research and Innovation] approach has to be a key part of the research and innovation process and should be established as a collective, inclusive and system-wide approach" (http://ec.europa.eu/research/science-society/document_library/pdf_06/options-forstrengthening_en.pdf).
11) See http://www.pacitaproject.eu.
12) See the EU CORDIS website: http://cordis.europa.eu/project/rcn/98487_en.html
13) The aforementioned EMERIT project sustained the idea of enlarging the social dialogue to encompass science and technology issues, with the participation of civil society, while acknowledging the formalized and structured social dialogue typical of the Belgian model of concerted social action.

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